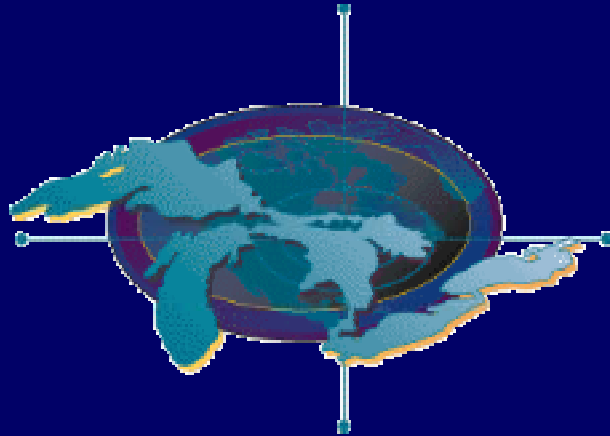


Biological Integrity of the Great Lakes Basin



Presented by: Douglas Dodge

Good Morning.

In this presentation, I shall describe the results of various activities that focus on the biological integrity of the Great Lakes Basin,-activities necessary to prepare for this conference.

Overview of this Presentation

- Biological Integrity (BI) – Why & What
 - BI 2001 Workshop
 - Interviews
- Results
 - Proposed BI Indicators
- Emerging Issues
- What's Next: at SOLEC 2002 & Beyond

SLIDE 2. BIOLOGICAL INTEGRITY

I shall overview the why and what of Biological Integrity, and include summaries of both a 2001 Workshop and a 2002 series of interviews.

I shall review two lists of indicators that have been proposed to describe biological integrity based mainly on the current suite of Great Lakes indicators. I will then share my view of some significant emerging issues.

Finally, I shall outline some next steps both at SOLEC 2002 and beyond.

Why Choose Biological Integrity for SOLEC 2002?

- SOLEC is rooted in the Great Lakes Water Quality Agreement (GLWQA)
- Purpose of the GLWQA ... “to restore & maintain the chemical, physical & biological integrity of the waters of the Great Lakes Basin Ecosystem”



SLIDE 3. 'Why choose biological integrity?'

For the next part of my presentation, you will need to refer to your textbook, the Great Lakes Water Quality Agreement.

Choosing biological integrity for SOLEC 2002 has been an ultimate step in the path to understanding the Great Lakes Ecosystem.

Let Me Explain

SOLEC is rooted in the GLWQA.

Part of Article II of the GLWQA refers to programs necessary “for a better understanding of the Great Lakes Basin”

In the GLWQA, Canada and the United States are committed to share information about the state of the Great Lakes ecosystem, -to provide this “better understanding”-, in an open and constructive environment. SOLEC is an important venue for meeting this commitment.

Purpose of the GLWQA “to restore & maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem”

The first few conferences described the health of various components of the Basin Ecosystem. This approach was a valuable and logical start to assessing ecosystem health.

- The Basin is an integrated entity and is more than just water
- SOLEC 1998 expanded focus from “waters” to basin ecosystem
- Physical and chemical integrity are forces acting on biological integrity



SLIDE 4. Basin is an integrated entity, Basin is more than just water

We need to see the Basin as an integrated system, and much more than just water

Some of you may consider the jump from reporting on the condition of the “waters” as a significant alteration of the intent of the GLWQA. However, the authors of the 1978 version of the GLWQA anticipated this concern, in part, by including a reminder in the Preamble using the following words...

“...restoration and enhancement of the boundary waters cannot be achieved independently of the other parts of the Great Lakes Basin Ecosystem...”

Since 1998, SOLEC has focused its reporting within a basin ecosystem perspective.



SLIDE 5.

So why start with biological integrity?

Natural systems with a high level of biological integrity can withstand and recover from the effects of most natural disturbances, but this capability to recover is compromised when the type, and intensity of a stress is outside the evolutionary history of the biota of a system.

[Karr et al, 1986 delete this]

Biological integrity inevitably bears the brunt of changes in the Basin ecosystem; both physical and chemical conditions are usually implicated in these changes.

The state of the Biological Integrity of the Basin is the ultimate measure of the state of the health of the Great Lakes Basin Ecosystem.

It seemed appropriate to value life first, and in whatever form it occurs.

What is BIOLOGICAL INTEGRITY?

- For SOLEC 2002

“Biological integrity is the capacity to support and maintain a balanced, integrated & adaptive biological system having the full range of elements [the form] & processes [the function] expected in a region’s natural habitat”

James R Karr, 1991 (modified)

AND

Why is Biological Integrity Important?

SLIDE 6. What is BIOLOGICAL INTEGRITY?

For SOLEC 2002, we adopted a working definition:

“Biological integrity is the capacity to support and maintain a balanced, integrated and adaptive biological system having the full range of elements [the form] and processes [the function] expected in a region’s habitat.”
Karr 1991, modified

2001 Biological Integrity Workshop

- State of knowledge
- Do current indicators measure biological integrity?
- Do we need new indicators?
- Other factors affecting biological integrity

SLIDE 11. 2001 BIOLOGICAL INTEGRITY WORKSHOP [2]

Using the case studies to provoke discussion and critical analyses, we asked participants at the workshop to Explore the state of knowledge regarding the impacts of non-native species;

AND

using the biological indicators in the 2000 SOLEC Selection of Indicators report, consider how to make these current indicators more relevant to the task of measuring Biological Integrity

Are new indicators needed, and for what component of the system?

What factors other than non-native species could be affecting biological integrity?

2001 Biological Integrity Workshop

- Other factors combine with non-native species to intensify stress
- Options for management
- Issues & questions for further work at SOLEC 2002

SLIDE 12.

How might these other factors combine with non-native species to intensify stress

We asked participants to explore options for management

Finally, we asked them to identify what next needs doing, and what are some issues & questions for further work at SOLEC 2002.

James Karr on the Biological Integrity Workshop "Approach"

- *Think gradient*
- *Understand baseline condition*
- *Think holistically*

SLIDE 10. JAMES KARR ON THE WORKSHOP "APPROACH"

We were fortunate to have Dr. James Karr at this workshop; he has had a significant influence on the understanding of biological integrity of aquatic systems, especially through the development of indices designed to detect changes in biological integrity

This summary is my interpretation of some of Dr Karr's comments at the workshop.

- *Think gradient*

Avoid thinking in terms of sites that are impaired or unimpaired. Sites reflect a gradient of biological condition from undisturbed (biological integrity) to various levels of degradation.

- *Understand baseline condition*

All sites have a biological condition expected in the absence of human activity (biological integrity)

Few if any sites reflect that condition today.

But that benchmark condition still provides a stable base that can be used to evaluate sites with diverse human influence and serve as benchmark, guide, and goal for assessment and planning.

- *Think holistically*

Consider the entire process from conception of the problem to development of indicators through to the communication of the results to policymakers and citizens into 5 critical phases.

Those phases are conception, design, sampling, analysis, and communication.

Try moving all of them forward, at the same time.

